

Amendments to the Claims: This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A reusable self-aligning precision latch, comprising:

- a) a latch body for mounting a latch assembly, including an interface cone;
- b) a lead screw, coupled to the latch body on one end, that pivots at an interface on the latch body allowing for self-alignment;
- c) a drive cam having a plurality of surfaces and positioned on the lead screw engaging a plurality of linkage assemblies such that at least two links are driven;
- d) a flexured ball assembly having a ball and a floating clamp plate in contact with the ball, said floating clamp plate maintained perpendicularly to an axis of the flexured ball assembly by a compliant member,
said flexured ball assembly clamped by the plurality of linkage assemblies to the latch body with a the floating pivoting-clamp plate such that all clamping forces between the floating pivoting-clamp plate and the latch body are equalized; and
- e) a motor for closing and opening the self-aligning precision latch by turning the lead screw to apply and release, respectively, the clamping forces between the pivoting clamp plate and the latch body.

2. (Original) The reusable self-aligning precision latch claimed in claim 1, wherein the motor and the lead screw combine to provide controlled movement of a plurality of clamping pawls.

3. (Original) The reusable self-aligning precision latch claimed in claim 1, wherein the plurality of linkage assemblies includes a coupler link and a follower link.

4. (Original) The reusable self-aligning precision latch claimed in claim 3, wherein a nub on the coupler link is positively engaged on one of the plurality of surfaces of the drive cam.

5. (Original) The reusable self-aligning precision latch claimed in claim 1, wherein the plurality of linkage assemblies comprised of a coupler link, a follower link, and a drive cam form a four bar linkage mechanism.

6. (Original) The reusable self-aligning precision latch claimed in claim 5, wherein the follower link is grounded upon one of the plurality of surfaces of the drive cam such that a simple lever mechanism remains.

7. (Original) The reusable self-aligning precision latch claimed in claim 6, wherein the follower link is driven by the drive cam to apply the clamping forces.

8. (Currently Amended) The reusable self-aligning precision latch claimed in claim 1, wherein the flexured ball assembly includes:

- ~~a) a ball;~~
- ~~b) a floating clamp plate, in contact with the ball, and maintained perpendicularly to an axis of the flexured ball assembly by a compliant member; and~~
- ~~c) a flexure having a retaining flange for capturing the compliant member prior to latching.~~

9. (Original) The reusable self-aligning precision latch claimed in claim 8, wherein the compliant member is selected from the group consisting of an O-ring, a rubber band, and a spring.

10. (Currently Amended) A method for latching, employing a kinematic, self-aligning precision latch, comprising the steps of:

- a) holding the precision latch open in its initial state to provide unobstructed axial and radial ball seat clearances to receive a flexured ball assembly;
- b) positioning a plurality of clamping pawls over a floating clamp plate of the flexured ball assembly to fully capture the clamp plate preventing displacement from a latch seat;
- c) making contact with the clamp plate with a follower link in a manner as to equalize forces on the clamp plate wherein the clamp plate is in contact with a ball and maintained pivotably perpendicular to an axis of the flexured ball assembly by a compliant member;
- d) applying a force to the clamp plate by effectively grounding the follower link of a four bar mechanism, thereby, forming a simple lever to obtain mechanical advantage at the clamp plate;

e) providing a clamping force on the clamp plate by deforming a coupler link via a cam; and

f) locking the precision latch in its final state with action from a fixed displacement portion of the cam.

11. (Original) The method claimed in claim 10, wherein the step of positioning a plurality of clamping pawls over a clamp plate includes combining action of a motor and a lead screw to provide controlled movement of the plurality of clamping pawls.

12. (Original) The method claimed in claim 10, wherein the follower link is a part of a linkage assembly that also includes a coupler link.

13. (Original) The method claimed in claim 12, wherein a nub on the coupler link is positively engaged on one of a plurality of surfaces of the cam.

14. (Original) The method claimed in claim 12, wherein the linkage assembly comprised of the coupler link, the follower link, and the cam form a four bar linkage mechanism.

15. (Original) The method claimed in claim 14, wherein the follower link is grounded upon one of the plurality of surfaces of the cam such that a simple lever mechanism remains.

16. (Original) The method claimed in claim 15, wherein the follower link is driven by the drive cam to apply the clamping force.

17. Cancelled.

18. Cancelled.